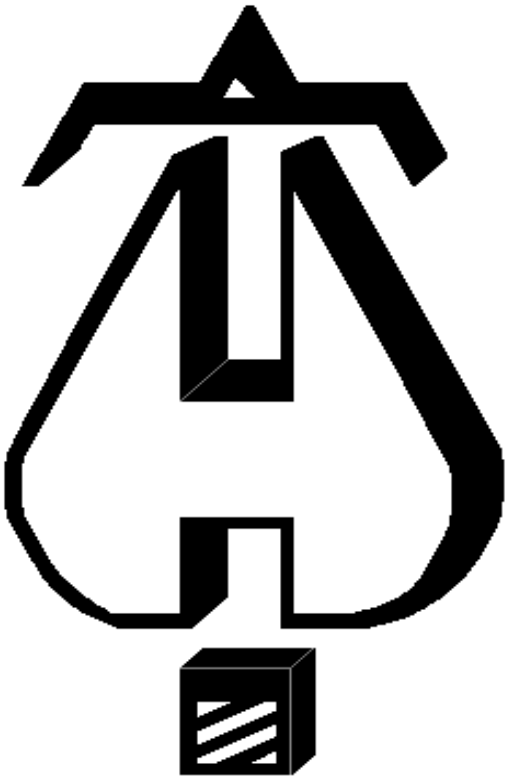


. . . Fire Protection by Computer Design

High Tech Fire Protection
84 Hackett Mills Road Poland
P.O. Box 154 Minot, ME
Poland, ME 04274
207-998-2551

Job Name	:	1ST FLOOR SHALOM HOUSE
Building	:	Shalom House
Location	:	503 Woodford Street Portland
System	:	zone 1
Contract	:	
Data File	:	1st floor.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - Shalom House 1st Floor pendent Date - 9/13/13
Location - 503 Woodford Street Portland
Building - Shalom House System No. - zone 1
Contractor - High Tech Fire Protection Contract No. -
Calculated By - Ed Poulin Drawing No. - FP-01
Construction: (x) Combustible ( ) Non-Combustible Ceiling Height 8'
OCCUPANCY - Residential 13R

SYSTEM DESIGN

Type of Calculation: ( )NFPA 13 Residential (x)NFPA 13R ( )NFPA 13D
Number of Sprinklers Flowing: ( )1 ( )2 (x)4 ( )
( )Other
( )Specific Ruling Made by Date

Listed Flow at Start Point	- 14	Gpm		System Type
Listed Pres. at Start Point	- 8.2	Psi	(x) Wet	( ) Dry
MAXIMUM LISTED SPACING	16	x 16	( ) Deluge	( ) PreAction
Domestic Flow Added	- na	Gpm	Sprinkler or Nozzle	
Additional Flow Added	- na	Gpm	Make GLOBE	Model GL4910
Elevation at Highest Outlet	- 17	Feet	Size 1/2"	K-Factor 4.9
Note:			Temperature Rating 155	

Calculation Summary: Gpm Required 61 Psi Required 49 At Test
C-Factor Used: Overhead 150 Underground 150

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 9-14-13	Rated Cap.	Cap.
Time of Test - 8:30 am	@ Psi	Elev.
Static (Psi) - 84	Elev.	
Residual (Psi) - 82	Other	Well
Flow (Gpm) - 1186		Proof Flow Gpm
Elevation - 5		

Location: Test Hydrant # 01978 on Woodford Street

Source of Information: Portland Water District

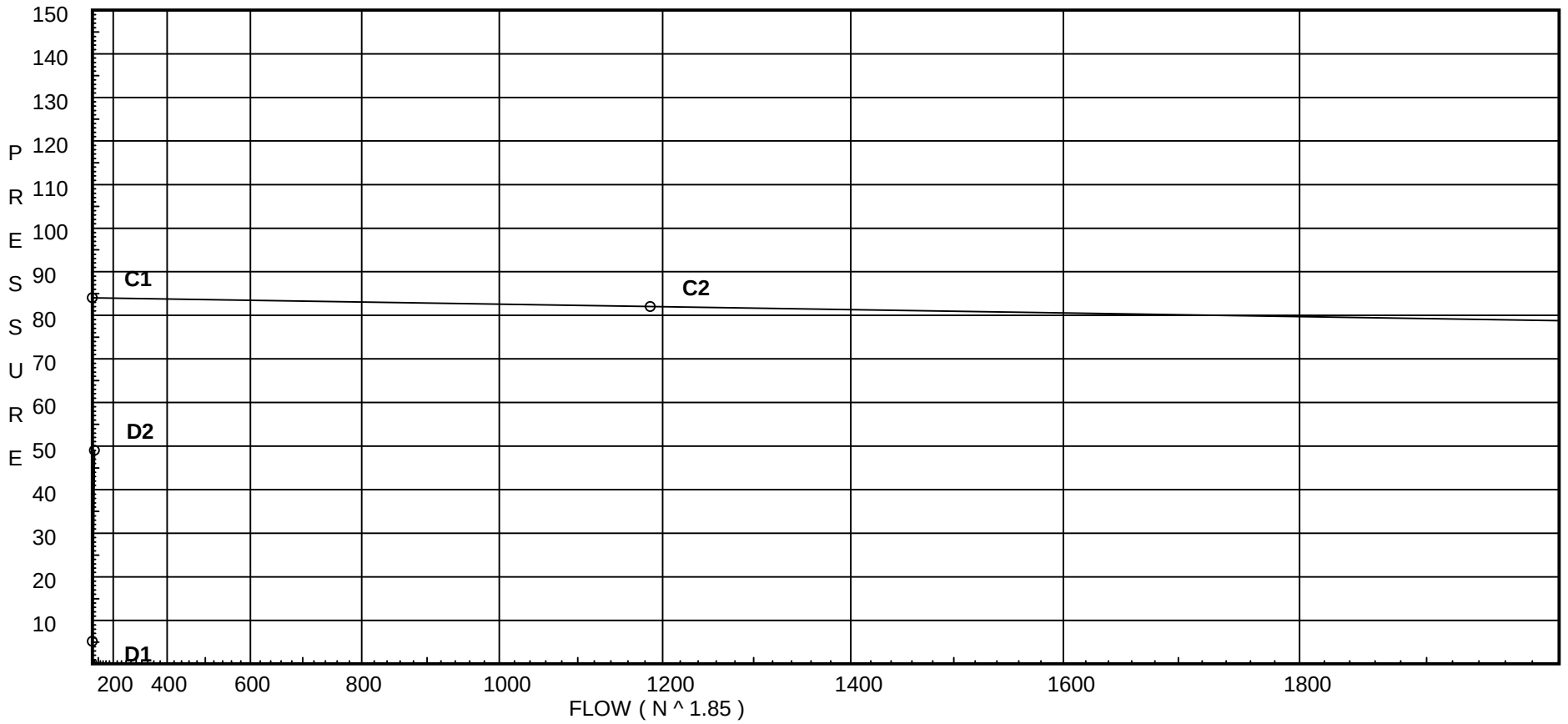
Water Supply Curve (C)

High Tech Fire Protection
1ST FLOOR SHALOM HOUSE

Date 9/13/13

City Water Supply:
- C1 - Static Pressure : 84
- C2 - Residual Pressure: 82
- C2 - Residual Flow : 1186

Demand:
- D1 - Elevation : 5.197
- D2 - System Flow : 60.265
- D2 - System Pressure : 48.979
- Hose (Demand) :
- D3 - System Demand : 60.265
- Safety Margin : 35.013



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zik	Wilkins 950XL	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DP1	-1.0	4.9	8.2	na	14.03	0.05	256	8.2
DP2	-1.0	4.9	8.2	na	14.03	0.05	256	8.2
10	17.0	K = K @ EQ01	8.05	na	14.03			
11	17.0	K = K @ EQ02	8.28	na	14.29			
12	17.0	K = K @ EQ01	9.42	na	15.18			
13	17.0		9.82	na				
14	16.5		12.18	na				
20	17.0	K = K @ EQ01	11.49	na	16.77			
21	17.0		11.92	na				
22	17.0		12.19	na				
BA	17.0		14.56	na				
BB	16.5		16.19	na				
BC	16.5		22.46	na				
BD	6.5		29.45	na				
BE	6.5		32.2	na				
BF	6.5		35.5	na				
BG	3.0		40.32	na				
BASE	0.0		47.92	na				
HOSE	0.0		51.14	na				
TEST	5.0		48.98	na				

The maximum velocity is 14.66 and it occurs in the pipe between nodes 13 and 14

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
DP1	14.03	1.101	1N	7.0	1.000	8.200		K Factor = 4.90
to		150.0		0.0	7.000	-0.433		
EQ01	14.03	0.0352		0.0	8.000	0.282		Vel = 4.73
	0.0							
	14.03					8.049		K Factor = 4.95
DP2	14.03	1.101	1O	5.0	1.000	8.200		K Factor = 4.90
to		150.0		0.0	5.000	-0.433		
EQ02	14.03	0.0353		0.0	6.000	0.212		Vel = 4.73
	0.0							
	14.03					7.979		K Factor = 4.97
10	14.03	1.101		0.0	6.400	8.049		K Factor @ node EQ01
to		150.0		0.0	0.0	0.0		
11	14.03	0.0353		0.0	6.400	0.226		Vel = 4.73
11	14.29	1.101	1O	5.0	6.900	8.275		K Factor @ node EQ02
to		150.0		0.0	5.000	0.0		
13	28.32	0.1296		0.0	11.900	1.542		Vel = 9.54
	0.0							
	28.32					9.817		K Factor = 9.04
12	15.18	1.101	1O	5.0	4.750	9.418		K Factor @ node EQ01
to		150.0		0.0	5.000	0.0		
13	15.18	0.0409		0.0	9.750	0.399		Vel = 5.12
13	28.32	1.101	1N	7.0	0.500	9.817		
to		150.0		0.0	7.000	0.217		
14	43.5	0.2864		0.0	7.500	2.148		Vel = 14.66
	0.0							
	43.50					12.182		K Factor = 12.46
14	43.50	1.394		0.0	2.500	12.182		
to		150.0		0.0	0.0	-0.217		
22	43.5	0.0908		0.0	2.500	0.227		Vel = 9.14
	0.0							
	43.50					12.192		K Factor = 12.46
20	16.77	1.101	1N	7.0	1.750	11.492		K Factor @ node EQ01
to		150.0		0.0	7.000	0.0		
21	16.77	0.0491		0.0	8.750	0.430		Vel = 5.65
21	0.0	1.101	1O	5.0	0.500	11.922		
to		150.0		0.0	5.000	0.0		
22	16.77	0.0491		0.0	5.500	0.270		Vel = 5.65
22	43.49	1.394	1O	6.0	8.300	12.192		
to		150.0		0.0	6.000	0.0		
BA	60.26	0.1659		0.0	14.300	2.373		Vel = 12.67
BA	0.0	1.394	1N	8.0	0.500	14.565		
to		150.0		0.0	8.000	0.217		
BB	60.26	0.1659		0.0	8.500	1.410		Vel = 12.67
BB	0.0	1.394	3N	24.0	13.800	16.192		
to		150.0		0.0	24.000	0.0		
BC	60.26	0.1659		0.0	37.800	6.272		Vel = 12.67
BC	0.0	1.394	1N	8.0	8.000	22.464		
to		150.0		0.0	8.000	4.331		
BD	60.26	0.1659		0.0	16.000	2.655		Vel = 12.67

Final Calculations - Hazen-Williams

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
BD	0.0	1.682	1E	4.95	12.500	29.450		
to		120.0	1T	9.9	14.850	0.0		
BE	60.26	0.1004		0.0	27.350	2.747		Vel = 8.70
BE	0.0	1.682	2E	9.9	23.000	32.197		
to		120.0		0.0	9.900	0.0		
BF	60.26	0.1005		0.0	32.900	3.306		Vel = 8.70
BF	0.0	1.682	1Fsp	0.0	3.000	35.503		
to		120.0		0.0	0.0	4.516		* Fixed loss = 3
BG	60.26	0.1003		0.0	3.000	0.301		Vel = 8.70
BG	0.0	2.157	1Zik	0.0	2.000	40.320		
to		120.0		0.0	0.0	7.536		* Fixed loss = 6.237
BASE	60.26	0.0300		0.0	2.000	0.060		Vel = 5.29
BASE	0.0	1.917	1G	1.047	75.000	47.916		
to		150.0	1E	5.235	16.752	0.0		
HOSE	60.26	0.0352	1T	10.47	91.752	3.226		Vel = 6.70
HOSE	0.0	12.46	1G	9.829	375.000	51.142		
to		140.0	1E	44.231	152.352	-2.166		
TEST	60.26	0.0	1T	98.292	527.352	0.003		Vel = 0.16
	0.0							
	60.26					48.979		K Factor = 8.61